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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
TAMAI, KARL I

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/876,203	GRADE ET AL.	
	Examiner	Art Unit	
	Tamai IE Karl	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *21-27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 21-27 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 21 is a combination-subcombination of claim 1, where the particulars of the subcombination (the movable structure being capable of moving at resonant frequency and a damping fluid damping the movement of the structure at resonant frequency) are not included in the combination of the damped comb assembly of claim 21.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 21-27 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the electromagnetic actuator of claim 6, the electromagnetic and electrostatic actuator of claim 7, must be shown or the features canceled from the claims. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 6-12 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. The disclosed device will not operate as an electromagnetic device.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 6-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claims 6-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not contain an enabling or a full, clear, concise, and exact written description of an electromagnetic device. The specification only provides a description of an electrostatic actuator, which is not a magnetic device. For the purposes of advancing prosecution on the merits the

examiner will assume that the applicant is claiming an electromechanical device, which an electrostatic device is a type of electromechanical device.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 6, 7, 8, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Koh (US 6,636,183). Koh teaches an electrostatic actuator with the optical element and comb actuator in a fluid. It is inherent that the actuator can be operated at resonant frequency and the fluid will damp the movement at the resonant frequency. The electrostatic actuator having combs and springs where the comb electrodes being drag inducing members.

9. The rejection of Claims 1-4, 6, 7, 13, 16, and 19 under 35 U.S.C. 102(b) over Matsumoto (US 5,477,097) is withdrawn.

10. The rejection of Claims 1-3, 6, 7, 8, 11-13, 16, 17, and 19 under 35 U.S.C. 102(b) over Cho et al. ("Viscous Energy Dissipation in Laterally Oscillating Planar Microstructures: a Theoretical and Experimental Study) is withdrawn.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 2, 3, 4, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koh (US 6,636,183) and Mallary (US 6359757). Koh teaches every aspect of the invention except the fluid having a viscosity greater than air. Mallary teaches the fluid is a dielectric liquid which inherently has a greater viscosity than air. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct actuator of Koh with the fluid of Edwards to increase the strength of the actuator.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koh (US 6,636,183). Koh teaches every aspect of the invention except the fluid being a super critical fluid. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Koh with the fluid being a super critical fluid because it has been held that mere selection of a known material on the basis of

suitability for the intended use is within the ordinary skill in the art. (see *In re Leshin*, 125 USPQ 416).

14. Claims 9, 11, 12, 16, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koh (US 6,636,183) and Jerman et al. (US 5,998,906). Koh teaches every aspect of the invention except comb electrodes moving from not interdigital to inerdigital and fin. Jerman teaches a comb actuator where the electrodes act as drag fins. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Koh with the electrodes of Jerman to provide an electrostatic actuator with stable rotation even at low speeds, to drive and optical switch.

15. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koh (US 6,636,183). Koh teaches every aspect of the invention except the Q factor of the actuator. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Koh with Q factor between .3 to 20 or .5 to 3 to optimize the performance of the actuator in various fluids. (see *In re Aller*, 105 USPQ 233; holding where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

16. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koh (US 6,636,183) and Jerman et al. (US 5,998,906). Koh and Jerman teach every aspect of

the invention except, the electrodes having a length of 200-2000 microns. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Koh and Jermane with the electrode length between 200-2000 microns to optimize the performance of the actuator. (see *In re Aller*, 105 USPQ 233; holding where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art).

17. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koh (US 6,636,183) and Jerman et al. (US 5,998,906), in further view of Hirano et al. (Hirano)(US 6,495,944). Koh and Jerman teach every aspect of the invention except, the closed loop control of the actuator. Hirano suggests that closed loop control is an advantage for electrostatic resonators (col. 1, line 44). It would have been obvious to person of ordinary skill in the art at the time of the invention to construct the actuator of Koh and Jerman with the closed loop control of Hirano to provide resonator control of the actuator.

Response to Arguments

18. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new grounds of rejection.

The Applicant's argument regarding the drawings, 35 USC 101 and 112 first paragraph rejection of claims 6-12 is not persuasive. While every electric field has a magnetic component (and vice-versa), the magnetic actuator drives the mover by

magnetic attraction and repulsion, while an electrostatic actuator operated by attractive/repulsive electrical electrodes. The specification discloses an electrostatic comb drive which inherently has a magnetic field, but it is not a magnetic actuator. The Applicant's argument that all electrostatic actuators are inherently electromagnetic actuators is not persuasive. Electrostatic actuators and electromagnetic actuators are both MEMS (microelectromechanical devices), but they are separate types of actuators. The examiners refers to Dhuler et al. (US 6,428,173) which describes in column 1, lines 24-45 that piezoelectric, magnetic, thermal, and electrostatic are separate types of MEMS based on how the actuator is driven. The objection to the drawings and the rejection under 35 USC 101 and 112, 1st paragraph are proper and maintained.

Conclusion

19. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (703) 305-7066.

The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Nestor Ramirez, can be reached at (703) 308-1371. The facsimile number for the Group is (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Karl I Tamai
PRIMARY PATENT EXAMINER
May 6, 2003

KARL TAMAI
PRIMARY EXAMINER